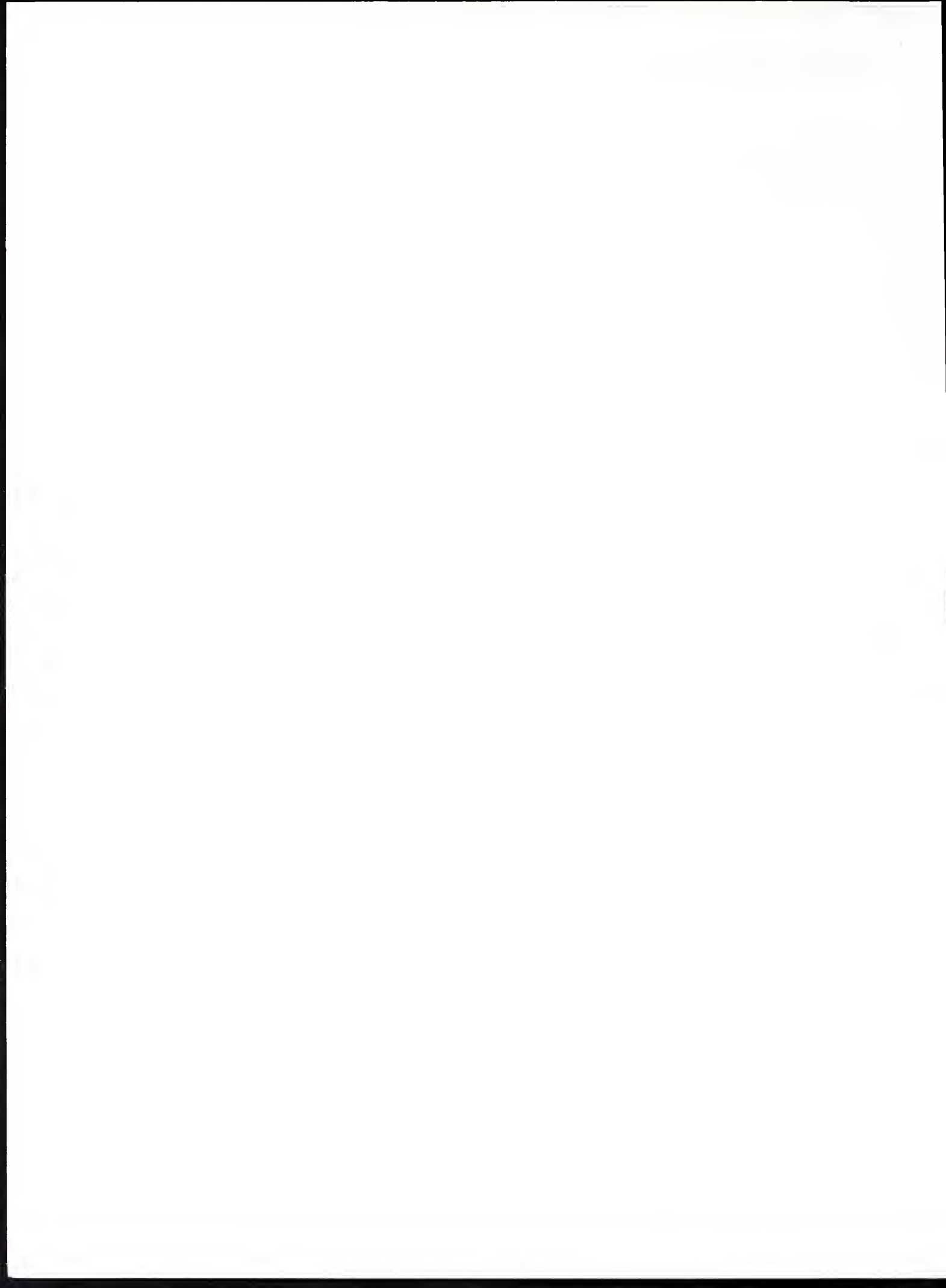


LEARNING TO WRITE: AN ANALYSIS OF WRITING SAMPLES FROM PARTICIPANTS
IN THE ALPHABETIC BRAILLE AND CONTRACTED BRAILLE (ABC) STUDY

While there is a growing body of research about the development of literacy in young braille readers, there has been limited attention to the mechanical and conceptual process of how young blind children learn to write. Writing is generally taught to young braille students by using a braillewriter, although occasionally the skill is introduced through the use of a slate and stylus or an electronic braille device. Each tool requires very different patterns of coordination than writing in print, which raises questions about how the differences in physical production influence the quantity and quality of written products. Blind children also have distinctive experiences with conceptual learning, which raises the question of whether content variations in written products might exist. However, there is little published evidence of the way in which children who are blind learn to write, particularly during the early elementary years when children first learn the form and meaning of writing.

This article reports data from writing samples that were produced by students who read braille and whose literary skills were documented in the Alphabetical Braille and Contracted Braille Study (ABC). This research study, which was funded by the American Printing House for the Blind with substantial support from the Canadian Braille Literacy Foundation, mainly sought to identify distinctions between young readers who learned braille contractions early and those who learned them later (Emerson, Holbrook, & D'Andrea, 2009). However, the study also yielded extensive data about general literacy development of the participants, including writing skills. The data was gathered from writing samples produced annually by young readers over a two to five-year period between preschool and third grade.



Writing data were analyzed from 114 samples produced between 2002 and 2007 by 39 students. Students who produced the samples were permitted to write in braille using any device they preferred. Two samples were produced using electronic braille devices (Braille Note and Mounbatten brailler), and all of the remaining samples were produced using the Perkins braillewriters. Seven *prewriting* samples were also reviewed; these were preschool and kindergarten samples that included few or no conventional braille symbols, but were assigned meaning by the children who read them as words. They were not included in the general analysis because they did not contain recognizable braille symbols, but they are typical of preschool writers who are learning that symbols are a means of relating ideas and information.

Evaluating writing samples of young children is complex because writing involves both the physical process of transcription as well as the creation of meaning through words. Some researchers have emphasized measures that assess the process of transcription, such as word and sentence copying; others have analyzed production through such measures as correct punctuations, sentences, words written, and words correctly spelled (Coker & Ritchey, 2010). The limited vocabulary and varied writing proficiency of young writers make it challenging to conduct reliable analysis. In a review of literature on curriculum-based writing measures, McMaster and Espin (2007) found only weak relationships between holistic writing sample quality and specific measures such as Words Written and Words Correctly Spelled; they recommended that qualitative measures be considered along with quantitative features of writing, especially at lower grade levels when the relationship of technical features with general writing quality is not clearly supported by research.

Reliable writing assessment of young children poses an even greater concern when considering the writing of visually impaired students, given the distinctive factors related to writing devices and the absence of a body of research on writing development. Research on writing of blind students has primarily investigated students who were at mid-elementary level or

Writing data were analyzed in two ways.

Students' Endpoints were analyzed in two ways.

They were scored for content, form, and style.

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older. In a recent study, Kreuzer (2007) analyzed the writing productions of fourth and fifth grade students who had low vision or were blind. She gathered two writing samples each from 15 blind, 15 low vision, and 15 sighted students; one sample was elicited from a prompt about an imaginary scenario, while the second was about the students' own experiences. From these samples, she analyzed data related to the number of words and the percentage of abstract nouns and adjectives. Holistic scores were assigned for each composition, and parts of speech that included abstract and concrete nouns, pronouns, adjectives, and adverbs were assessed. Some distinctions in word use among blind and low vision students were found: both groups of visually impaired students used more concrete and fewer abstract nouns in their imaginative samples, and blind students used fewer adjectives in the same samples. Holistic writing scores were also significantly lower for blind and low vision students for writing based on experience, although scores were similar for blind students and sighted peers for imaginative writing. Interestingly, students with low vision in Kreuzer's study wrote significantly shorter samples than sighted students for both imaginative and experiential writing, unlike blind participants. While many blind students in this study chose to use electronic notetakers to produce their samples, no student with low vision elected to write using a computer or any adaptive device.

A detailed case study of two late elementary students revealed two very different styles of composition planning and development. Leyenberger-Pfohl (1987) combined regular observations and student-produced journals to develop case studies about a 10-year-old girl, Connie, and a 13-year-old boy, Roy, as they planned and wrote compositions over a school year. Students read aloud their journals and drafts of their compositions with the researcher, and their interactions were audio- or videotaped. In addition, a survey about writing attitudes was administered at the beginning of the project, which reflected a low level of apprehension of the two students. The students were distinctive in their composition styles: while Connie planned globally and produced several revisions of each paper, Roy often did not plan and rarely revised

LEARNING TO WRITE ABC

Other in a personal study of the subject of handwriting.

Grade students who have been in the study of the subject.

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after the first draft. Connie often reviewed and checked her paper, while Roy more often examined the last characters in his composition. Roy attended to the physical aspects of his writing such as punctuation and errors, while Connie concentrated on the meaning. The author's recommendations emphasized the importance of composing through organizing, writing, and revising.

Several studies have addressed the writing production of high school students. Koenig (1987) analyzed writing samples produced by 84 students who were blind and who were 9, 13, or 17 years of age. He compared the samples to writing produced by sighted students according to prompts and scoring rubrics developed for the National Assessment of Educational Progress (as cited in Koenig, 1987). Sample analyses included rhetorical effect, cohesiveness, syntax, spelling, and error types. Students in the 9 and 13-year-old age groups performed similarly to sighted peers, and in some areas such as spelling and rhetorical effect they out-performed sighted students. The 17-year-old group performed similarly to sighted peers in some areas, but their samples were weaker in rhetorical effect, cohesiveness, and spelling. The author noted that the oldest group included more students who attended specialized schools, suggesting that these might be students who had more academic difficulties and required more educational support. For all groups, the most common braille errors were lower cell contractions such as *by*, *into*, *to*, *in*, *was*, and *be*.

A more recent study of literacy skills by Ryles (1997) investigated literacy skills of visually impaired students who learned braille early with those who learned braille later or not at all. When writing samples of these three groups were rated by English teachers along with samples of sighted students, the samples of early braille readers were rated as high as or higher than those of sighted peers, unlike samples of the later braille readers and visually impaired students who did not read braille.

LEARNING TO WRITE ABC

After the first date, a student should be able to write the letter 'A'.

Examine the last character in the word 'A'.

Write the letter 'A' on the line.

Write the letter 'A' on the line.

Write the letter 'A' on the line.

Write the letter 'A' on the line.

Write the letter 'A' on the line.

Write the letter 'A' on the line.

Write the letter 'A' on the line.

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Write the letter 'A' on the line.

Literature related to writing skills of blind students suggests wide skill variation among school-aged braille readers, with possible areas of difficulty related to vocabulary use, composition structure, and cohesiveness for some students. However, the scant literature, the differences in research designs, and the absence of investigation of writing at the early elementary levels yields an incomplete body of information about how writing skills develop for young blind children. The writing samples produced for the ABC braille study provide an initial longitudinal investigation of a process that can illuminate features that affect the quality of writing for children who read braille.

This article reports findings from the writing data that address the following questions:

1. Is there a relationship between Words per Passage (WPP)/Words per Sentence (WPS) and students' knowledge of contractions?
2. Is student knowledge of contractions related to the quality of compositions?
3. What types and frequency of miscues occurred in the writing samples?
4. What mechanical characteristics of braille writing were demonstrated over time by study participants?
5. Are there differences in composition scores and miscue frequency of students who were the highest and lowest achievers?
6. What patterns of writing development were evident in individual participants?

Method

In the spring of each year of the ABC study, participating students produced a writing sample to provide comparative information on writing proficiency and spelling in an unstructured task. An observer from the research study gave an oral prompt to initiate the writing task, and students were asked to load paper into their braillewriters and to write independently about the topic. The prompts were as follows.

LEARNING TO WRITE ABC

I have been asked to write a letter to my friend.

about my school and my friends.

My school is very big and my friends are very nice.

I have many friends and I like to play with them.

My school is very big and my friends are very nice.

I have many friends and I like to play with them.

My school is very big and my friends are very nice.

I have many friends and I like to play with them.

My school is very big and my friends are very nice.

I have many friends and I like to play with them.

My school is very big and my friends are very nice.

I have many friends and I like to play with them.

My school is very big and my friends are very nice.

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My school is very big and my friends are very nice.

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My school is very big and my friends are very nice.

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My school is very big and my friends are very nice.

I have many friends and I like to play with them.

My school is very big and my friends are very nice.

I have many friends and I like to play with them.

My school is very big and my friends are very nice.

I have many friends and I like to play with them.

My school is very big and my friends are very nice.

I have many friends and I like to play with them.

Kindergarten: Write about your favorite thing to do at home.

First Grade: Write about your favorite thing to do at recess.

Second Grade: Write about your favorite thing to do with your friends.

Third Grade: Write about your favorite thing to do on the weekend.

Fourth Grade: Write about your favorite thing to do for a holiday or on vacation.

No time limit was imposed for the samples, so the length of samples depended on students' motivation and interest as well as their writing stamina. Researchers were encouraged to say as a little as possible when the samples were being produced, although in some cases it was necessary to repeat the prompt or to provide encouragement so that the students would produce a written sample. Researchers videotaped the production of the samples without displaying the child's face so that the children's writing techniques and re-reading of their compositions could be observed.

Contractivity and Word/Passage Length

The relationship between knowledge of contractions (contractivity) with WPP and WPS was examined using a two tailed Pearson bivariate correlation analysis. For both the WPP and WPS, Pearson correlation analysis was used to examine both the relationship between the overall mean WPP and WPS of each student's writing samples and mean contractivity as well as the relationship between actual scores at each grade level and the actual number of contractions known at that grade level. Contractivity was calculated based on the total number of contractions that each student mastered during each year of the study, as reported annually by their teacher of visually impaired students on the checklist provided in the *Assessment of Braille Literacy Skills* (ABLS) (Koenig & Farrenkopf, 1995).

Composition characteristics

Kindergarten Writing and Reading

First Grade

Second Grade

Third Grade

Fourth Grade

Fifth Grade

Sixth Grade

Seventh Grade

Eighth Grade

Ninth Grade

Tenth Grade

Eleventh Grade

Twelfth Grade

Thirteenth Grade

Fourteenth Grade

Fifteenth Grade

Sixteenth Grade

Seventeenth Grade

Eighteenth Grade

Nineteenth Grade

Twentieth Grade

Twenty-first Grade

Twenty-second Grade

Twenty-third Grade

Twenty-fourth Grade

Twenty-fifth Grade

The quality of composition content was analyzed according to a three-category ranking system developed for the study (Schoch, 2007). Using this form, each sample was assigned from one to three points in each of the three categories of Content, Organization, and Voice/Style/Tone. Thus, each sample could be assigned 0 to 9 points.

Scoring categories included:

Content: Multiple thought units with descriptors; evidence of reflective and creative thinking

Structure: A clear beginning and ending, with all sentences related to theme

Voice/Style/Tone: Addresses audience; attempts humor; describes feelings and reactions

A Pearson two-tailed correlation was conducted to determine whether there was a relationship between the quality of composition and the level of contractivity as well as the level of reading achievement.

Miscue Analysis

Miscues for all samples were counted and classified according to whether they were *phonetic, braille-related, or unknown*. A writing miscue was a word that was not conventionally written using either contracted or uncontracted braille, or using any combination of correct contractions. If part of the word was contracted and part was written alphabetically, it was not considered to be a miscue. Braille-related errors were categorized according to type: missed dot, added dot, horizontal transposition, vertical transposition, duplication of letters, and use of whole words as part words.

Writing mechanics

During the second year of the study, the research team decided to also document students' writing mechanics. At that point, researchers were asked to videotape from an angle where hand and finger movements could be observed. In many cases this was not possible or observers overlooked the taping, so visual analysis of writing mechanics was possible for only about half the writing samples. The first author rated each usable tape for appropriate fingering.

The design of computer programs for writing

system developed for the study (see Table 1).

Use of three control groups

Two control groups

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use of line spacer, firm pressure on keys, checking working during writing, and changing line on hearing the bell. Items were rated as evident Consistently, Sometimes, and Not Observed.

High and low achievers

To explore the relationship of writing skills and reading achievement, the writing compositions of the six highest achieving readers in the study were compared with those of the seven lowest achieving readers. Low achieving students were those whose reading assessments were at or below grade level throughout the study, while high achievers were at or above grade level on all reading assessments (Emerson, Sitar, Erin, Wormsley, & Herlich, 2009). A t test was used to compare mean numbers of Words per Sentence, Words per Passage, and Composition scores of the two groups.

Results

Contractivity and Word/Passage Length

The two tailed Pearson bivariate correlation analysis of WPP and WPS with contractivity was calculated using mean scores across grade levels as well as individual raw scores for each grade level. The only statistically significant correlation was a positive correlation between overall Words per Passage and contractivity; as students mastered more contractions, the overall mean number of Words per Passage increased. Pearson two-tailed correlation for contractivity and Words per Passage scores was .388 ($p = 0.016$).

Composition and Contractivity

There was no significant relationship between contractivity and composition scores. Composition scores were calculated only for students who had writing samples for both grades One and Two. This was done because few students had complete samples in Kindergarten (due to shortness of passages or absence of composition format) and most of those that could be scored consisted of one or two simple sentences such as "I like to play at home. I like to play ball." Twenty-nine students had samples that could be scored from both Grade One and Grade

LEARNING TO WRITE AND

use of line space than prose writing. The use of line space is a skill that is learned through practice. The use of line space is a skill that is learned through practice.

There are many ways to learn to write and use line space. One way is to practice writing on lined paper. Another way is to practice writing on a computer. A third way is to practice writing on a tablet.

One

Another way to learn to write and use line space is to practice writing on a computer. A third way is to practice writing on a tablet.

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Two; only 20 students had samples from Grade Three, and 11 from Grade Four. Therefore, only samples from the Grade One/Two combination were scored to ensure that differences in data were not the result of maturity or of missing samples at the higher and lower grades.

Each student's average score from the Grade One and Grade Two was calculated, and the relationship of that score with the level of contractivity was calculated. Pearson two-tailed correlation for contractivity and Grade One/Two content scores was .391 ($p = .0435$), which was not statistically significant (Schoch, 2008).

Writing Miscues

Writing miscues were analyzed for all writing samples. In total, 321 miscues were identified in the 113 writing samples. These miscues were classified into three types: *phonetic*, in which the miscues were attempts to spell according to the sounds of the word; *braille*, in which the error could be associated with braille rules or configurations; and *unknown*, in which the word was incorrectly written but there was no clear evidence of the reason for the error.

Eighty one percent (260) of writing miscues were phonetic, reflecting students' attempts to write an unfamiliar word based on their knowledge of sound/symbol relationships. Examples of these included *pritty* for pretty, *sandgo* for San Diego, and *chane* for chain. Only 13% (40) of the miscues were braille-related; these miscues were symbols that were probably due to an inconsistency in braille writing, as judged by similarity in symbols. These errors were classified by type, as displayed in Table 1. Horizontal (left/right) transpositions were the most common miscue, with 12 occurrences. The only braille rule-based miscues were 5 uses of whole-word contractions as part-words, as in writing *ding* for doing or *ouside* for outside. The remaining 6% (21) of miscues were configurations for which the origin could not be identified, as *ceebord* used for an unknown word.

Numbers of miscues per sample varied and were mainly associated with composition length. The number of miscues per passage length was calculated for each student. The largest number

LEARNING TO WRITE ARABIC

Two; only 20 minutes a day, and that is all that is needed.

Anyone can do this, and the only reason why some people

cannot is because they do not know how to do it.

It is a simple matter, and

it can be done in a very short time.

It is a simple matter, and

it can be done in a very short time.

It is a simple matter, and

it can be done in a very short time.

It is a simple matter, and

it can be done in a very short time.

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of total miscues was from a student who was among the lowest reading achievers; this student's miscues increased by grade level in keeping with the increased length of his writing passages.

The second largest number of writing miscues was generated by a student who was the highest achiever in the study; the majority of her miscues were phonetic spellings in kindergarten and first grade, when she wrote much longer passages than other students at the same grade level and included complex words such as *decided* (spelled *disideed*) and *grocery* (spelled *groseree*).

Occasionally miscues reflected limitations in literacy exposure that may result from blindness, as when one very capable student described her family's vacation stay at "Embasssee Sweets". A sighted student would probably have learned the correct spelling of the hotel name from multiple exposure to signs, napkins, pens, and other items that are usually available in hotel rooms.

Writing Mechanics

Writing mechanics were videotaped beginning in the second year of the study.

Videotapes could be analyzed for only 75 of the 114 writing samples due to missing videos or difficulty in videotaping at an angle that would show children's writing but not their faces. Rated skills included appropriate fingering, use of line spacer, firm pressure on keys, checking working during writing, and changing line on hearing the bell.

The percentage of students who consistently or sometimes used correct fingering is shown in Table 2. Correct fingering was interpreted to be use of the appropriate finger on the appropriate key. Operation of space bar was not considered; most students used an index finger to operate the space bar. Kindergarten and Grade One samples showed the highest percentage of correct fingering, with the lowest percentage observable in Grade Three.

The frequency with which students checked their own work during the writing process was also documented. Only three kindergarten samples could be rated, and two of these students did not check their work. In Grades One through Four, 62%-70% of students consistently checked their writing samples while they were writing. Between 16% and 28% of students at

of total minutes was from a subject who was not in the
treatment group by providing a subject with a subject who

The second largest number of minutes was from a subject who

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subject who was not in the treatment group by providing a subject with a subject who

never checked their work during composition. More than 90% of all students in videotaped samples consistently used the line spacer when appropriate, and 95% pressed firmly on the keys. Children failed to stop writing at the bell sometimes or always in about 25% of rated samples, usually in kindergarten or first grade.

Although students had a choice about how to produce their writing sample, only two of 75 samples were produced on a device other than a Perkins braillewriter. Both of these students used an electronic notetaker to write their final Grade Four sample. One of these students used the Mountbatten Brailier because her finger strength was limited due to a physical condition. In both cases, the electronically-produced sample was much longer than previous samples and was used in the last year of the study, Grade Four. One child produced a 76-word sample, in contrast to the previous 24-word sample. The other student wrote a 284-word sample, which was the longest sample produced by any child in the study and contrasted with her second-longest sample of 33 words. The two electronically-produced samples did not differ from previous samples with regard to the percentage of miscues or punctuation errors, but the first student wrote sentences in her electronic sample that were twice the length of sentences in her previous samples. No conclusions can be drawn about the effects of using an electronic device for spontaneous writing, particularly because both students were more academically advanced than the previous year, but the effects of using electronic devices for writing production is a important question for future research.

High and low achievers

The eight highest achieving students were compared with the seven lowest achieving students with regard to Words per Sentence, Words per Passage, and Composition scores. There were no significant differences in the groups for any of these three measures, as compared with a two-tailed t test. Miscues of the two groups were also examined for differences. The only notable difference was that the number of miscues in the samples of the high achieving students tended

never checked their work during composition or editing. The samples consistently showed that the students had not learned to write the letters correctly.

Children in the sample were not able to write the letters correctly.

When the children were asked to write the letters, they wrote the letters incorrectly.

The children in the sample were not able to write the letters correctly.

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to remain consistent or decrease over their years in the study, whereas the number of miscues of the low achieving group either remained stable or increased. Two of the seven low achieving students had the greatest number of miscues during their last year in the study, but this was not true of any higher achieving student.

Case Studies

One of the values of longitudinal research is the opportunity to observe change over time as students' productions are compared with their own writing from the previous year. Although writing samples were attempted for each child during each year of the study, only two children produced five writing samples for all five years of the study. Many children did not enter the study until the second or third year, and others produced kindergarten samples that could not be scored because they represented pre-writing, which included unconventional symbols that the child pretended to read as meaningful material. Although these samples could not be conventionally scored, the pre-writing samples demonstrate similarity with writing development of sighted peers' pre-writing endeavors that help to connect meaning with symbols.

The two students whose samples are described below provide examples of individual change over time. Their samples are not offered to respond to the primary questions of the study, but rather to demonstrate the variability of individual change that is evident in young writers.

Patricia

Patricia produced her first writing sample in kindergarten, and she wrote a sample each year through fourth grade. She was among the highest achieving students in the study, and she was introduced to contractions beginning in her kindergarten year, when she used some whole word alphabet contractions as well as *with* and *the*. She had been taught all 189 contractions by Grade Two. By her last year in the study, fourth grade, she was reading at an 8th grade level. Her oral vocabulary scores at Grade Three and Four were a year ahead of grade level, and her spelling score in Grade Four was at the 12th grade level on the Brigance.

LEARNING TO WRITE ADL

In a study conducted at the University of California, San Diego, the following results were obtained:

The low learning of the subjects was found to be due to the following factors:

1. The subjects were not given enough practice time.

2. The subjects were not given enough feedback.

3. The subjects were not given enough encouragement.

4. The subjects were not given enough support.

5. The subjects were not given enough motivation.

6. The subjects were not given enough information.

7. The subjects were not given enough resources.

8. The subjects were not given enough time.

9. The subjects were not given enough space.

10. The subjects were not given enough help.

11. The subjects were not given enough attention.

12. The subjects were not given enough encouragement.

13. The subjects were not given enough support.

14. The subjects were not given enough motivation.

15. The subjects were not given enough information.

16. The subjects were not given enough resources.

17. The subjects were not given enough time.

18. The subjects were not given enough space.

19. The subjects were not given enough help.

20. The subjects were not given enough attention.

21. The subjects were not given enough encouragement.

22. The subjects were not given enough support.

23. The subjects were not given enough motivation.

24. The subjects were not given enough information.

25. The subjects were not given enough resources.

Composition length and miscues. Table 1 shows data from the five samples about the number of words per passage and words per sentence as well as the percentage of miscues among the total words in each sample. Patricia's Kindergarten passage was longer than that produced by any other student in the study at kindergarten level, and passage length increased from Kindergarten to Grade One through Grade Two, when she produced a 207 word passage. After that, passage length decreased, and the Grade Four Passage was shorter than all except the Kindergarten passage. This may reflect the student's lack of interest in the generic prompts or a normal leveling-off of interest in the process of writing as more writing is required in school.

The first two passages had fewer words per sentence, but for the next three years the number of words per sentence was similar, ranging from 11.8 to 12.2. Standard adult writing is generally comprised of 15-20 words per sentence ("Ask Oxford", 2010), and by fourth grade this student was approaching that range, although sentence length stabilized in the last three samples.

Miscues compared with total words decreased over the first three samples, but remained stable at 1-2% after Grade Two. The Kindergarten sample contained more writing miscues than any other student's sample at that level, in part because the sample was longer and Patricia used more varied vocabulary than most students. Her Kindergarten sample included 12 writing miscues, most of which were invented spellings such as *rit(ble)* for *writing* and *prck* for *park*. On three occasions, she wrote gerund forms of "do" and "go" using an alphabet contractions: *ding* for *doing*, and *going* for *going*.

In Grade One, 21 of 149 words contained writing miscues. As in Kindergarten, most miscues were phonetic spellings of unfamiliar words: *groseree* for *grocery*, *aet* for *ate*, *disideed* for *decided*, *latter* for *ladder*, and *cusins* for *cousins*. In Grade Two, the number of miscues has decreased markedly; only 5 miscues were present among 205 words. She was then familiar with conventional spelling, and her only miscues were vegetables (written *vestables*), fruits (written *friuts*), season (written *seezin*), succeed (written *sucksed*), and equipment (written *eqitment*). She

Case studies and research

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used contractions appropriately in all instances, and she was now single spacing her brailled material. The Grade Three sample included only one miscue, the use of *lose* for *loose*. The Grade Four Sample also included only one true miscue (*actionally* for *occasionally*), as well as a spacing error in the word *watch*.

Composition and content. Patricia's average score for composition content was a 7.6 out of a possible 9 points, with the highest scores of 9 assigned for the Grade Two and Grade Three essays. Her essays were long and rich in content. From the beginning, Patricia's writing showed an understanding of writing as a form of meaning. In Kindergarten she already showed an awareness of the reader when she asked, "Do you like to play with Mom and Dad?"; she was the only child who used Voice in this way from the beginning, indicating an awareness of the reader's perspective. When asked to read the story, she read it fluently and with meaning, regardless of the errors she had made while writing.

I like doing with my Mom is riting and read my favorite with my Mom is eating. Mu fravx FAVORITE thing ding with my Dad is going to with car and griving DRIVING to the prck PARK. I love my Mom SHOM and Dad to do you like your Mom or Dad. To and I like to play with Mom for Dad to. Do you like to play with Mom and dad

The Grade One sample about Halloween experiences still contained no clear introduction or conclusion; however, Patricia described events in sequence and used standard words with many invented spellings. In contrast with the kindergarten sample, the Grade One sample included complex sentences with subordinate clauses: *When my cusins and I got to the groseree store, we got stiakers there.*

Her Grade Two composition about baseball included evidence of an introduction as well as two clear topical sections: eating healthy foods and working together with a team. For the first time, a conclusion was present: *Now you know how easy it is to work together in a game or*

used contractions appropriate to the level of the student.

mastered the Grade 1 level of writing.

but the student's writing was not yet at the

level of the Grade 2 level.

the student's writing was

not yet at the level of the

Grade 2 level of writing.

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sport. So tell that to your teacher or team mates that read all about baseball and have fun.

Patricia's writing now reflects a more complex understanding of Voice: she is writing to an audience, and she organizes her thoughts to promote understanding.

The Grade Three and Four samples were shorter than Grade Two. In Grade Three she described her three preferred weekend activities of reading, going to her cousin's house, and shopping. In her conclusion, she uses a simile that is especially interesting because it refers to color: *The weekend is like a crayon box. You don't know what color you are going to get.* The Grade Four sample is briefer, and it lacks the enthusiasm of previous essays; it is a repetitive series of sentences describing *My favorite thing to do on a holiday*, and it concludes with the sentence *I like to use the things I bring in my suitcase.* There is no development or originality of content in this essay, perhaps a result of an uninteresting prompt or of Patricia's diminishing enthusiasm with writing tasks with age. Although her essays are long and well constructed, she rarely uses adjectives or descriptions except in the case of identifier nouns such as *grocery store* or *crayon box*; the general purpose of her writing is to relate information.

Mary

Mary also generated five samples during her five years in the study, and she was introduced to contractions more gradually than Patricia, although she still learned contractions at a faster rate than 24 of the 43 children in the study. By spring of Grade Two she had learned 73 contractions; in Grade Three she had mastered 148; and by Grade Four she knew all 189 contractions. In spite of the teacher's documentation that she had learned most contractions, she did not spontaneously contract any words until her third writing sample, produced in Grade Two. In the last three sample^s she consistently contracted *and*, *the*, and *like* but did not use contractions on 10 other opportunities.

Mary's reading progress closely matched grade peers. In Grade Three she read at a third grade level, and in Grade Four, she was at a fourth grade level, as measured by the Johns Basic

Reading Inventory contextual reading; her vocabulary level, measured by the Brigance oral vocabulary score, was also on grade level during Grade Three and Grade Four. Her spelling scores on the Brigance were a year beyond grade level at both of these years.

Composition length and miscues. In spite of the fact that her reading was on grade level, Mary wrote very brief passages that ranged from 12 to 49 words, with the longest produced in Grade Two. For the first three grades, her sentences were very short, with about 6 words per sentence; in Grades Three and Four the length increased as she began to use greater variety in syntax. Because her sentences were short and included basic vocabulary, there were few miscues. In kindergarten, she wrote *sandbox* as *sad box*, *pink* as *pipk*, and *hole* as *hols*. No miscues occurred in Grades One and Three, but in Grade Two she wrote *slides* as *slfdes*; *shoot* as *shot*; and *merry-go-round* as *mary ground*. In her final sample she wrote *holiday* as *holday* and *because* as *dots 2356c*. Of the nine miscues, three appear to be related to braille writing errors (*pipk* for *pink*, *slfdes* for *slides*, and *2356c* for *because*).

Composition and content. Mary's average score for content was 4.6 out of a possible 9 points, with a low score of 3 in Grade One and a high score of 6 in Grade Two. Her writing samples were characterized by repetitive simple sentences, usually beginning with sentences that began with *I* or *we*. Her first sample, in kindergarten consisted of four simple sentences: *I like to ride my bike. I have a pink bike. I play in my sand box. I dig a hole in the sand box.* The Grade One sample was similar, but with just two simple sentences. By Grade Two, she again wrote simple sentences beginning "I like...", but she ended with a sentence that suggested a conclusion: *It is fun playing at recess.* The Grade Three essay included two compound sentences with a subject of *I* and multiple verbs: *Also I like to plant and ride my bike and sleep.* The final Grade Four composition shows greater variability in syntax with an explanation of why she likes Christmas: *I like it because it is very fun and you get a lot of presents.*

Reading memory connected with the sound of the letter.

Researcher found that the letter 'a' is written with a stroke.

Source in the British Museum of the letter 'a' in the 17th century.

Example of the letter 'a' in the 17th century.

Level 1: The letter 'a' is written with a stroke.

Level 2: The letter 'a' is written with a stroke.

Level 3: The letter 'a' is written with a stroke.

Level 4: The letter 'a' is written with a stroke.

Level 5: The letter 'a' is written with a stroke.

Level 6: The letter 'a' is written with a stroke.

Level 7: The letter 'a' is written with a stroke.

Level 8: The letter 'a' is written with a stroke.

Level 9: The letter 'a' is written with a stroke.

Level 10: The letter 'a' is written with a stroke.

Level 11: The letter 'a' is written with a stroke.

Level 12: The letter 'a' is written with a stroke.

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Level 16: The letter 'a' is written with a stroke.

Level 17: The letter 'a' is written with a stroke.

Level 18: The letter 'a' is written with a stroke.

Level 19: The letter 'a' is written with a stroke.

Level 20: The letter 'a' is written with a stroke.

Mary's compositions were short, and the content was limited to telling the reader what she liked to do. In response to the prompts, which all began, *What is your favorite...?*", Mary provided information but did not develop a fully formed response with a planned structure. Only in the last essay, in which she stated why she liked Christmas, did she go beyond informational content. Of the 133 words generated in her five essays, only one was an adjective or adverb. In that example, *pink bike*, the adjective may have been regarded as part of the name of the bike for Mary, who would not attach a visual significance to *pink*. Although she became more competent in writing varied sentences with more complex structures, the content of Mary's responses was devoid of detail or complex thought. For her, writing in this context appeared to be an academic exercise of creating correct sentence structures that addressed the prompt question.

The essays generated by Patricia and Mary demonstrate growth in both writing mechanics and their ability to convey meaning and personal thoughts through writing. One student used detailed language to embellish her thoughts, while the other generated sequences of simple sentences that expressed her preferences in response to the prompts. Both students wrote their longest essays in Grade Two, and their final Grade Four essays were shorter than the two previous years. This raises questions about possible changes in motivation, either in general writing or the use of the research writing prompts, as students mature. In spite of the contrast in styles, increased writing competence was evident in both girls during the five years they participated in the study, particularly with regard to decreased numbers of miscues and clearer structural development.

Discussion

The analysis of 114 writing samples from young braille readers showed wide variability in writing features such as length of passages, length of sentences, and frequency of miscues.

Mary's compositions were rated from 1 to 5 on the basis of the following criteria:

she liked to do in response to the prompt, and the quality of her writing.

provided information about the quality of her writing, and the quality of her writing.

in the first year, and the quality of her writing, and the quality of her writing.

in the second year, and the quality of her writing, and the quality of her writing.

in the third year, and the quality of her writing, and the quality of her writing.

in the fourth year, and the quality of her writing, and the quality of her writing.

in the fifth year, and the quality of her writing, and the quality of her writing.

in the sixth year, and the quality of her writing, and the quality of her writing.

in the seventh year, and the quality of her writing, and the quality of her writing.

in the eighth year, and the quality of her writing, and the quality of her writing.

in the ninth year, and the quality of her writing, and the quality of her writing.

in the tenth year, and the quality of her writing, and the quality of her writing.

in the eleventh year, and the quality of her writing, and the quality of her writing.

in the twelfth year, and the quality of her writing, and the quality of her writing.

in the thirteenth year, and the quality of her writing, and the quality of her writing.

in the fourteenth year, and the quality of her writing, and the quality of her writing.

in the fifteenth year, and the quality of her writing, and the quality of her writing.

in the sixteenth year, and the quality of her writing, and the quality of her writing.

in the seventeenth year, and the quality of her writing, and the quality of her writing.

in the eighteenth year, and the quality of her writing, and the quality of her writing.

in the nineteenth year, and the quality of her writing, and the quality of her writing.

in the twentieth year, and the quality of her writing, and the quality of her writing.

in the twenty-first year, and the quality of her writing, and the quality of her writing.

in the twenty-second year, and the quality of her writing, and the quality of her writing.

While the overall number of Words per Passage was related to students' knowledge of contractions, the number of Words per Sentence and the holistic content of their composition were not associated with contraction knowledge. The relationship with Words per Passage and contraction knowledge suggests the possibility that using contractions might reduce effort needed to produce more material, although the significance was modest.

It was interesting to note that most miscues (81%) were attempts to use phonetic rules in spelling; only 13% were related to braille code characteristics, even among the youngest students. This opposes the common belief that early use of contractions promotes poor spelling, especially when considered with the overall finding of the ABC Study that the students in the group were generally better spellers than their peers (Emerson, Holbrook, & D'Andrea, 2009). This finding also supports the overall conclusions of the ABC study that the literacy difficulties of blind students were not mainly associated with the braille code but are the same problems experienced by all young readers who are working to resolve the rules and irregularities of a complex written language.

The two case studies presented in the study suggest the value of using regular writing samples as a means of documenting student writing over time. For future research, writing prompts that stimulate more imaginative content might be considered to avoid repetitive and formulaic responses that were produced by some children; this option is supported by Kreuzer's research (2007), which found superior holistic scores by visually impaired students writing imaginatively as compared to experientially. Not unexpectedly, the types and frequency of miscues changed with maturity for most children, but competent writers like Patricia showed a more rapid decrease in writing miscues after first grade, while some other children in the study continued to write compositions with miscues throughout their writing samples.

Although the data on writing mechanics was confounded by the limited number of useable videotapes, some findings of interest emerged. One was the fact that fingering on the

LEARNING TO WRITE AND

While the lesson is being given, the teacher should be

concentrating on the student's handwriting and the

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braille keys became less consistent with age. It is possible that with increased familiarity and comfort with use of the brailewriter, students used more spontaneous fingering pattern to increase speed. It is also possible that teachers reduce emphasis on writing mechanics as a child becomes more proficient, especially if the student is producing accurate braille. Also, most young children used the index finger rather than the thumb to operate the space bar, a technique which is generally encouraged when teaching braille to adults. This may relate to differences in hand size and motor development, but there is no research on whether finger use on the space bar affects efficiency. While these questions are of interest, they should be interpreted with caution since the numbers of rated samples at the early levels are small. In addition, interobserver agreement was not assessed for the videotaped observations, which is a study limitation.

For teachers of young blind children, the results suggest the value of writing samples as a means of documenting skills over time. Aspects of writing such as planning and producing a full essay, writing words accurately, and developing an effective writing style can only be assessed through generation of written text. Teachers of students with visual impairments who leave spontaneous writing instruction to classroom teachers will miss opportunities to observe the applied use of contractions as well as the students' ability to resolve literacy problems related to creation of sentences or spelling of unfamiliar words.

Finally, the limitations of this analyses and the scant literature on the development of writing skills among braille readers support the need for future research on how blind children learn to write. As writing technology changes, speed and task demands of writing increase for the general population. The effects of using technological writing tools are unknown, but in this study group the two students who used technology to produce their samples wrote longer essays. This suggests the need for further investigation. The students in this study developed their writing skills in widely varying ways: some students wrote long, expressive essays that were filled with miscues, while others wrote short unimaginative passages that were perfectly

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punctuated and free of writing errors. In parallel with the general findings of the ABC study, these results address the importance of learning to read and write in a meaningful context in which individual assessment, experience, and intervention can assure learning over time.

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punctuated and free of word groups

these results address the gap in

which is central to the

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National Assessment of Educational Progress

Grade 1

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Table 1

Types of Braille Miscues

Missed dots 9	<i>Uf</i> for of ing for the 2356c for because p for and ing for the	stiaakers for stickers tg for to en for on drings for things
Added dot 6	23456ent for went <i>mame</i> for make vash46n for vacation (2) slfdes for slides;	I'p for I'm holied for holiday
Transposition (Horizontal) 12	<i>Thin</i> for then (2) <i>win</i> for went slide <u>gh</u> for slides trice for twice emportant for important wun for run	dhs for friends dun for fun fer for her si <u>ch</u> er for sister suing for singing
Transposition (Vertical) 7	Con for in (2) h for to ben25 for bench	256at for what dump for jump ghe for the
Duplicate letters 1	<i>Theen</i> for then	
Whole words used as part words 6	Ding for doing (2) Ging for going Griving for driving	ouside for outside (2)

Table 2

Use of Correct Fingering by Grade Level

Frequency	Kindergarten N = 5	Grade One N = 11	Grade Two N = 24	Grade Three N = 19	Grade Four N = 16
Consistently	2 (40%)	7 (64%)	13 (54%)	7 (37%)	8 (50%)
Sometimes	3 (60%)	3 (27%)	2 (8%)	4 (21%)	2 (13%)
Not Observed	0	1 (9%)	10 (42%)	8 (42%)	6 (38%)

Table 3

Composition and Sentence Length and Miscues for Patricia

	Kindergarten	Grade One	Grade Two	Grade Three	Grade Four
Words per passage	68	149	207	130	95
Mean words per sentence	9.9 (Two run-on sentences)	6.8	12.2	11.8	12
Percentage miscues compared to total words	19%	14%	2%	.05%	2%

Table 2

Comparison of the two groups

Group	Mean	Standard deviation
Control	1.0	0.5
Experimental	1.5	0.5

Comparison of the two groups

Group	Mean	Standard deviation
Control	1.0	0.5
Experimental	1.5	0.5

Table 4

Mary's Writing Miscues

	Kindergarten	Grade One	Grade Two	Grade Three	Grade Four
Words per passage	24	12	49	26	22
Mean words per sentence	6	6	6.1	13	11
Percentage miscues compared to total words	17%	0	10%	0	9%

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